

Lessons from Assessment of Health System Resilience: Political Economy and Policy Coherence, Two Essential but Neglected Components

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Resilience of health systems is referred to the capacity to prepare and respond effectively to crises, while maintaining the key functions. Designing a tool that can measure the conceptual structures of the definition of resilience at the level of the health system, is a necessary step to take action to address the shortcomings. We developed the quantitative scale based on the comprehensive Kruk framework and added two novel items to its awareness dimension. The study proposes some facets to be considered in the scale such as political economy of the health system, network governance, policy coherence, and discussed their necessities. The need to change the paradigm from traditional forms of health system governance to network governance to promote its resilience in the face of crisis is of particular importance. Network governance is a platform for policy coherence in government decisions at the time of epidemics that improves the resilience of the health system in the face of crisis. Innovating in financing and purchasing function, including targeting health system subsidies towards health prevention and promotion in disadvantaged areas and among vulnerable groups is a driving force for resilience.

Keywords: Resilience, political economy, Network governance, policy coherence, Covid19

Introduction

Coronavirus is a type of virus that poses long-term health threats because it is able to adapt to new environments through mutations and recombination. The COVID-19 pandemic has not only led to high morbidity and mortality but also to social, cultural and economic consequences. To reduce the effects of recurrence of COVID-19, it is necessary to reduce the risks and create a resilient system (1).

Resilience of health systems is referred to as the capacity to prepare and respond effectively to crises, while maintaining the key functions of the health system before, during and after the crisis (2). It is the adaptive and transformational ability of a system that allows it to adapt or change its characteristics or activities to make shocks easier, while maintaining its original structure to achieve its overall goals, or if its current situation is unstable, even changes its structure fundamentally to eliminate hazards (3, 4). The resilient health system is sufficiently prepared to face the crisis, resist the shock caused by it and respond to the consequences, and is able to protect itself and human lives from the health effects of the crisis (5). The resilience of a crisis-stricken health system, its ability to resist, assimilate, adapt, transform and recover from the effects of risk in an efficient and timely manner includes maintaining and renewing structures and the basic essentials tasks through risk management (6, 7).

The death of more than 10,500 people from Ebola was a warning to policymakers to invest in designing a resilient health system that can continue to provide services to the public while controlling the spread of the disease as the key to responding to crises (8). Following the outbreak of the Ebola virus from 2014 to 2016, the World Health Organization called on all countries to develop an integrated resilient health system that can respond to future threats (9).

Epidemic control depends on a coordinated response in key areas of the health system, including monitoring, identifying cases, tracking and limiting contacts, clinical management, and accurate infection control. This coordinated response requires intra-sectoral governance, including the provision of infrastructure, trained manpower, essential medicines and delivery to the target population; and the ability to coordinate this response is a key sign of health system resilience (10). Designing a tool that can measure the conceptual structures of the definition of resilience at the level of the health system in the face of crisis, is a necessary step to know the health system resilience against disease and take action to address the shortcomings.

Introduced frameworks for assessing resilience against the spread of infectious diseases including COVID-19

Various studies have designed and presented frameworks for assessing the health system resilience. Meyer et al., With the aim of measuring the capacities, capabilities and processes that the health system needs to ensure resilience in the face of the spread of infectious diseases and natural hazards, designed a health system resilience checklist based on a review of research background, interviews with experts, and the results of a pilot meeting that covers ten general categories including a list of capacities that include the basic capacities of the health system, critical infrastructure, financing, barriers to accessing health services, cooperation and participation, leadership and command structure, capacity development, risk communication, human resources and infection control. The need for validation

and evaluation of compliance, applicability and acceptance of checklists according to the background conditions of other countries has been recommended by the authors(11).

Focusing on shock prediction and proper preparation and also the ways to respond to challenges, the United Kingdom's Department for International Development also published a policy summary outlining key principles for improving health system resilience in the face of the COVID-19 pandemic: Development of available bottleneck for medical supplies, prioritize the list of essential health services, build trust in local communities, establish appropriate communication at all levels of the health system, support and encourage staff, facilitate rapid resource flow to front-line providers, and flexibility in its use, ensure the rapid tracking of health information and the expansion of effective partnerships and networks(12).

The World Health Organization and the European Observatory on Health Systems and Policies have developed thirteen strategies for resilient response to the shock from COVID-19 and strengthening the resilience of the health system, including: effective and participatory leadership with a strong vision and communication, coordination of activities in government and among key stakeholders, crisis-responsive organizational learning culture, effective information system, timely monitoring to detect shocks and their effects, ensuring adequate financial resources in the health system and flexibility in reallocating and injecting more resources, ensuring the stability of health financing through countercyclical financing mechanisms and health financial reserves, the flexibility in purchasing health services and reallocating resources to meet changing needs, comprehensive health coverage, adequate level of human and physical resources and its proper distribution, ability to increase capacity to cope with a sudden increase in demand, motivated and supported manpower, alternative approaches to service delivery. For each strategy, cases are designed for evaluation along with related indicators(13).

Studies on the evaluation of resilience against COVID-19 in the world

Some studies have considered the proper and timely response system of countries as the resilience of the health system. In order for assessing the resilience of the health systems of Hong Kong, Singapore and Japan against the Covid 19 pandemic, Legido et al. have examined the performance of these three countries in ten key dimensions of health systems, including adaptation, government-level coordination, adoption of Covid 19 treatment funding policies, maintaining routine health system functions, access to intensive care and medicine, education and adherence to infection prevention and control measures, information system management, risk map and political climate and shown that the health systems of the three countries have been able to adapt, but if the pandemic lasts for several

months and the number of people in need of service increases, their resilience will be affected(14).

Some other studies have evaluated the performance of the health system in its six functions in the six-block model of the health system in the face of the COVID-19 pandemic. For example, Legido et al. evaluated the health systems of Spain and Taiwan and showed that the resilience of the Spanish health system in the functions of the service delivery system and the information system has been more successful than other functions, and the Taiwanese health system has been very successful in all its aspects (15, 16). The assessment of the resilience of the health system according to the same framework in Trinidad and Tobago showed that the country has been successful in all pillars, especially governance and the COVID-19 independent service delivery system within its larger health system relying on political will, evidence-based decision-making, coordinated, timely and inter-sectoral actions (17).

Framework used to design quantitative tools

Through a comprehensive reviewing of the frameworks for assessing the resilience of health systems in the disease outbreak crisis, the comprehensive Kruk model was selected. The framework was first developed at Harvard's School of Public Health in 2015 based on resilience frameworks designed in a variety of disciplines such as ecology, engineering, psychology and public health. In this context, resilient health systems should have five dimensions: **awareness** of available resources and emerging challenges, **diversity** in action against a wide range of challenges, **self-regulation** to limit crises and avoid disastrous consequences in other areas of health system, response **integrity** including the involvement of different actors and institutions and **adaptability** through flexible processes (18, 19).

In their 2017 study on the five-dimensional resilience framework, Kruk et al. examined the perspectives of actors on a global, national, and local (Libya) level regarding the necessary priorities for building a resilient health system and designing a health system response to the crisis based on these priorities. This study resulted in operationalizing the concept of health system resilience, prioritizing and describing different aspects of each dimension of resilience and showed that the greatest development of resilience in the Libyan health system during the crisis has been in three dimensions of awareness, integration and adaptation and the least progress has been in the dimensions of diversity and self-regulation (20).

In their other study in 2017 based on the conceptual framework presented in their previous study and following the global call to measure the resilience capacity of health systems before the crisis, Kruk et al. proposed a set of measures of health system resilience, including existing indicators of health system readiness such as international health regulations, the Global Health Security Agenda and the Millennium Development Goals, as well as new measures. The index balances

between slower resilience drivers (availability of trained local staff) and faster resilience drivers (high emergency reallocation rules) and reflects ongoing resilience, meaning that while maintaining continuous operation, encourages the reduction of threats and dangers facing the health system and can be used as a framework for developing national health programs. The introduced resilience index is prospective, but some of its measures, such as service and quality indicators that should be routinely collected, indicate the gradient of resilience, that is, the degree and speed of returning the health system to its initial state or better state after facing the shock. This index helps countries to assess whether their health systems can withstand shocks (21).

Evaluation method

The introduced index contains 25 measures that have been presented in 5 foregoing dimensions. After obtaining permission from the original designer, measures were translated into Persian by two members of the research team and the measures expressions were converted into question. Multidimensional expressions that examine several variables simultaneously were broken down into several questions. Two questions were added to the first dimension (**awareness**): first, has the health system responded appropriately to the World Health Organization's first warning at the right time? And second, was there a reliable and real-time system for controlling rumors and refining the reality of rumors? These issues are very important at the beginning of the crisis, however, they were not seen in the measures. The number of questions reached 31, 8 questions in the awareness dimension, 4 questions in the diversity dimension, 3 questions in the self-regulation dimension, 10 questions in the integration dimension and 6 questions in the adaptation dimension. For each item, a 5-point Likert scale from very inappropriate to very appropriate was used.

To ensure the conformability of Persian translation to the original text and the fluency of the sentences, the Persian version was translated into the original language by the members of the research team. Then the English versions were compared and the ambiguities were removed. The tool was then sent to the original designer for final approval. From the point of view of the conformability of the translation to the main tool and the correct and accurate transfer of the intended concepts in the translated version, the approval was announced by the designer. In order to evaluate the quality of face validity, 10 health system experts in related fields examined the tool in terms of appropriateness and optimal relationship of items with the dimensions of the tool and the existence of words reflecting the desired concept, and experts' opinion is fully applied. To evaluate the content validity, two methods, quantitative and qualitative methods, were used. In the qualitative review of the content, the relevant experts were consulted so that after carefully studying the tool, in terms of the extent to which the items cover its meaning and dimensions, they can present their corrective views and suggestions in detail and the experts' judgment was taken into account.

Content validity ratio (CVR) and content validity index (CVI) were used in order to quantitatively evaluate the content validity. By matching all questions with the minimum value of content validity ratio in the Lawshe table, all 31 questions were retained in the questionnaire. Regarding the content validity index score, all questions scored at least above the threshold. Confirmatory factor analysis method was used to evaluate the construct validity.

The online (Web-based) questionnaire was designed. The research sample included experts, managers in the health system with a history of activity in the health system or cooperation with the health system at all levels. For representativeness of the sample, a wide range of individuals at all levels and function areas of the health system were considered for response. The analysis of resilience and its dimensions from the perspective of health system actors was done by separating their levels of activity and areas of activity including stewardship, financing, services delivery in both public and private sectors, education and research and resource generation.

Findings of resilience assessment in the Iranian health system

The results indicated the high reliability of the questionnaire in examining the five dimensions of resilience. Questions on the dimensions of integration, awareness and adaptation had higher reliability than the dimensions of diversity and self-regulation. The dimensions of awareness, diversity, self-regulation, integration and adaptation had a high correlation with the resilience factor and the five dimensions with high explained variance explained the resilience. The output analysis of the mentioned factor analysis indicates the acceptable correlation matrix of the factor analysis.

Equivalent to %72.3 of the variance of the resilience factor was explained by the five dimensions of resilience, which indicates the high amount of explained resilience variance by the five dimensions. The amount of factor loading of the mentioned dimensions, which shows the correlation with the resilience factor, was high. The average resilience of the health system is 41.1%, which indicates moderate resilience. The lowest value with 36% belongs to the self-regulation dimension and the highest value belongs to the adaptation dimension(22).

Important points about the tool

This tool has been one of the first quantitative tools to measure the resilience of the health system in the face of an outbreak crisis, which can be considered as a step towards making the health system more prepared to face crises. The results of a quantitative study based on this framework showed that the comprehensiveness of this tool has been proven and is sufficient to analyze the resilience of the health system. Adding two items to the awareness dimension of the Kruk et al. model or the focus on "the urgency of designing a response after the announcement of an international warning" and "refining rumors from reality"

has contributed to develop the model and further adaptation to pandemics. However, it seems that other important measures can be proposed in the tool measures to increase the efficiency of resilience measurements.

The structure of political economy of governments has two dimensions of political structure, including public institutions in the three branches of executive, legislative and judicial, as an appendix to the second dimension, namely economic structure. Recognizing the role of economic and political factors contributing to the weakness of health systems in the face of recent epidemics such as Ebola and COVID-19 (23), makes it necessary to pay attention to the political economy of the health system, which includes: consequences of loss of human capital such as death of healthcare personnel, lack of transparency and accountability for government affairs and the rule of law in the middle of the epidemic (24), political motives for allocating government resources include the misallocation of financial resources or health human resources to areas commensurate with the political and social goals for the epidemic management (25).

The political context is very important in the government's response to cross-border, unique and unpredictable crises such as COVID-19, because crisis management is formed in this context (26). Paying attention to the variables of an effective macroeconomic system to deal with the outbreak of the disease, including unemployment, inflation, poverty and malnutrition, equitable distribution of wealth and government income, before and during epidemics, plays an important role in the health system's resilience to epidemics. Countries in social crises such as war, or economic crises such as sanctions and negative economic growth and recession, specifically will not be able to have a resilient health system against the crisis of the spread of the disease. Limited institutional capacity, lack of a unified system for epidemic management, and widespread corruption, limit capacity to respond effectively to the crisis, and weaknesses in the health system exacerbate the negative effects of the crisis on the population. Institutional maturity of the country includes the proper regulation of relations between health system actors, including the private sector and non-governmental organizations, and their participation in achieving the goals of public health coverage in times of stability, are a necessity for being able to use their resources in response to epidemic crisis.

The World Health Organization recognizes governance as an inter-sectoral function of the health system that affects the performance of all other functions, but its role is often overlooked during crises (27). In pandemics with a common feature of lack of sufficient information and knowledge, changing and unpredictable conditions, and the large number of organizations involved in the response, as well as organizations that do not have sufficient participation, governance is of great importance. Under these circumstances, network governance to improve preparedness and response in the form of a network of actors and communication between them will be effective in controlling the

epidemic and its effects, because in an epidemic situation where market mechanisms and hierarchies are ineffective, the network, as a governance structure or governance tool, will be the most appropriate governance option (28). Since policy networks are recognized as an effective form of solving complex problems such as pandemic crises, the need to change the paradigm from traditional forms of health system governance to network governance to promote its resilience in the face of crisis is of particular importance.

Policy coherence means integrating economic, environmental and social dimensions into health policies at all stages of policy-making in different sector of the government to synergize the achievement of goals, which is a prerequisite for achieving resilience required by health in five dimensions: vertical (between the national level and the provinces), horizontal (different policy areas), geographical (balanced risk reduction in all regions), temporal (appropriateness of today's policy decisions for future conditions), justice (taking into account the poor)(29, 30). Network governance is a platform for policy coherence in government decisions at the time of epidemics that improves the resilience of the health system in the face of crisis.

On the other hand, policy learning from crisis management which means establishing a systematic relationship between overcoming a crisis shock and learning from its experiences by preparing for the next shock to improve health system performance is often the forgotten link in health system resilience as policymakers become involved in the day-to-day issues of health systems in the midst of a crisis (13) . Learning includes the process of producing, recording and transferring knowledge, past failures and the factors involved in it and sharing this information to reduce the likelihood of future failures, reviewing policies as soon as new information is received and identifying unexpected factors, as the most important factor in success of countries like Korea in the COVID-19 crisis has been recognized the learning from past failures in the 2015 MERS crisis. What is vital for policy learning is effective governance, information flow, transparency and citizen participation, which in turn rooted in the country's political context (26). Considering the importance of policy learning to avoid the repetition of failures at different stages of the crisis response cycle, the institutional and systemic memory of the health system should be considered as a component of resilience.

The framework used seems to focus on the two capacities of shock absorption and adaptation and pays less attention to its structural and functional transformation capacity, while many fundamental reforms arise from crises, and infrastructural changes to meet the needs of the crisis and adapt to the situation will be not a choice but a necessity, and emergencies will accelerate and facilitate acceptance and cooperation. Ebola in Africa, For example, despite all the damage it has done, provided an opportunity for a serious discussion about building health systems with strong public health capacity to detect and respond to epidemics (31).

Innovation which includes designing and using contingency approach to provide services in crisis situations, for example by setting up mobile diagnostic centers to make the response more effective, as well as innovating in financing and purchasing function, including targeting health system subsidies towards prevention and promotion of health in disadvantaged areas and among vulnerable groups, as a driving force of resilience, is a key factor in the capacity for adaptation and transformation of a health system.

The results of the assessment of the global response to crises have shown that there is a need to establish a link between programs related to the agenda of strengthening the health system and health security for prevention, alert and response. The two must be pursued together to lead to the development of a resilient health system (32). Health security is beyond the mere focus on response to disease and covers key factors in epidemics, including poverty (33). Promoting health security includes ensuring that an effective health system is always available to individuals before, during and after the crisis (34). On the other hand, the health system's commitment to the universal health coverage agenda helps ensure a resilient health system. Countries with an inclusive and well-functioning health system can prevent further outbreaks of the disease when the chances of a rapid response to an outbreak are still high (35). Universal health coverage helps prevent the onset of outbreak shock in a timely manner by preventing outbreaks via providing early warning for all patients to have quick access to health care, better access through reliable infrastructure and the health care workforces(32). Therefore, the degree of implementation of international health regulations and the realization of health security as a prerequisite for resilience of health needs, are important as measurement measures of resilience.

Studies have shown that injustices in the form of out-of-pocket payments, access to health services, and health effects on individuals increase during and after crises (36). Since the poor have less access to health services in a stable situation than other income groups (37, 38), there is a need to design targeted policy interventions for these groups in terms of easy access to the health system with no financial difficulties and avoid the poor from giving up seeking services related to or unrelated to the epidemic crisis. Although financial protection indicators are considered in terms of resilient, focusing on the poor is particularly important.

Further studies in this area using the tools approved in this study and the model introduced can measure the resilience of the health system in other stages of the crisis and measure the effects of policy interventions on improving resilience.

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